We claim:

1. A process for delivering a molecule to an extravascular cell in a mammalian tissue in vivo comprising: inserting an injection solution containing the molecule into the lumen of a vessel wherein the volume of the injection solution and the rate of injection solution insertion result in transient increased tissue size and extravascular fluid volume within the tissue, extravasation of the molecule and delivery of the molecule to the extravascular cell.
2. The process of claim 1 wherein fluid flow out of the target tissue is occluded.
3. The process of claim 1 wherein insertion of the injection solution results in increased permeability of vessels in the tissue to the molecule.
4. The process of claim 1 wherein the molecule consists of a biologically active compound.
5. The process of claim 1 wherein the molecule consists of a macromolecule.
6. The process of claim 5 wherein the macromolecule is greater than 5 kDa.
7. The process of claim 6 wherein the macromolecule is greater than 30 kDa.
8. The process of claim 7 wherein the macromolecule is greater than 500 kDa.
9. The process of claim 1 wherein the molecule consists of a protein.
10. The process of claim 1 wherein the molecule consists of a peptide.
11. The process of claim 1 wherein the molecule consists of a polymer.
12. The process of claim 1 wherein the molecule consists of a therapeutic molecule.
13. The process of claim 1 wherein the molecule is in a complex.
14. The process of claim 1 wherein the injection solution contains a compound that increase vessel permeability.
15. The process of claim 14 wherein the compound consists of a vasodilator.
16. The process of claim 1 wherein the cell consists of a liver cell.
17. The process of claim 16 wherein the liver cell consists of a hepatocyte.
18. The process of claim 1 wherein the cell consists of a skeletal muscle cell.
19. The process of claim 1 wherein the cell consists of a heart muscle cell.

20. The process of claim 1 wherein the cell consists of a prostate cell.

21. The process of claim 1 wherein the vessel consists of a blood vessel.

22. The process of claim 21 wherein the blood vessel consists of an artery.

23. The process of claim 21 wherein the blood vessel consists of a vein.

24. The process of claim 1 wherein the vessel consists of a bile duct.

25. The process of claim 1 wherein the injection solution contains less than 20 mM salt.

26. The process of claim 25 wherein the injection solution contains less than 5 mM salt.

27. The process of claim 1 wherein the injection solution contains zwitterions.

28. The process of claim 1 wherein the injection solution is hypotonic.

29. The process of claim 1 wherein the injection solution is hypertonic.

30. An process for delivering a molecule to an extravascular in vivo mammalian cell in a tissue comprising: inserting a sufficient volume of injection solution containing the molecule into the lumen of a vessel at an appropriate rate and impeding fluid flow away from the tissue such that extravascular fluid volume in the tissue and size of the tissue are transiently increased, resulting in extravasation of the molecule and delivery of the molecule to the extravascular mammalian cell in the tissue.